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EXAMINER	
PERILLA, JASON M	
ART UNIT	**PAPER NUMBER**
2634	15

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/529,429	BAHLENBERG ET AL.
	Examiner	Art Unit
	Jason M Perilla	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-29,31-41,43-45 and 47-54* is/are rejected.

7)☒ Claim(s) *30,42 and 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-6/00*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 27-54 are pending in the instant application.

Information Disclosure Statement

2. The information disclosure statement (IDS) received on June 23, 2000 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The proposed drawing changes in the amendment filed on March 18, 2004 are accepted by the examiner. Replacement drawing sheets will be required when the case is allowed.

Response to Arguments and Amendments

4. The new title is accepted by the examiner.

5. It is noted by the Examiner that the rejections previously set forth in the first office action (paper no. 12) were not traversed by the Applicant. No arguments were made in response to the rejections. Rather, the claims were amended in response to the rejections. Hence, it is noted that the rejections made in the first office action were considered to be both proper and persuasive by the Applicant.

6. Applicant's arguments, see page 10, filed March 18, 2004, with respect to the USC § 112 rejection of claims 7 and 20 have been fully considered and are persuasive. The rejections of claims 7 and 20 have been withdrawn.

7. Upon further consideration of the previously cited references and new references, the precious indicated allowability made during the first office action of certain dependent claims is withdrawn. The new rejections follow below.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 39, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi (5673290 – previously cited in the first office action).

Regarding claim 39, Cioffi discloses a telecommunications system comprising: a central station (fig. 6, ref. "ONU"); subscriber lines of different lengths, the subscriber lines being grouped into longer and shorter lines, shorter lines are defined as lines having a length less than X, and longer lines are defined as lines having a length equal to or greater than X, where X is a system parameter determined for a given telecommunications system. It is inherent that the telecommunications system of Cioffi will consist of subscriber lines of different lengths. Cioffi also discloses that there are fundamental differences in applicable data rates that are dependent upon the length of the subscriber lines (col. 6, line 62 – col. 7, line 7). Further, it is inherent that among lines of differing lengths, some lines are considered "longer" and some lines are considered "shorter". An arbitrary distinction between the long lines and the short lines can be made by the selection of a distinguishing distance "X". Because Cioffi has made

a distinction between longer lines and shorter lines, the selection of a distinguishing distance X is inherent to allow for a determination between the longer and shorter lines. Cioffi has made a grouping distinction between longer and shorter lines, and therefore, Cioffi has inherently defined the shorter lines to be those which are shorter than X and the longer lines to be those which are longer than X. Cioffi further discloses a plurality of data modems linked to a central station by subscriber lines of differing lengths (fig. 6; col. 7, lines 33-43), in which duplex data is transmitted between the central station and one or more modems using DSL (col. 1, lines 31-33). Cioffi discloses that the subscriber lines are grouped into longer and shorter lines (col. 6, line 62 – col. 7, line 7). Cioffi further discloses that data is transmitted by a first duplex format using discrete multi-tone transmission (col. 2, lines 37-40). Discrete multi-tone transmission is known in the art as OFDD and is characterized by the use of multiple carriers for both the upstream and downstream transmissions. FDD is known in the art as dividing the upstream and downstream transmission channels in a wired communication system using different carriers. OFDD uses multiple "tones" (col. 1, line 25) or carriers and can accommodate higher bandwidth. Hence, OFDD modulation is capable of higher transmission rates, and FDD is capable of lower transmission rates. Cioffi teaches that systems of shorter loop distances are able to handle higher transmission rates, and systems with longer loop distances are limited to lower transmission rates (col. 6, line 62 – col. 7, line 7). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize a first duplex format or FDD at lower frequencies for transmission over longer lines and a second duplex format or

OFDD at higher frequencies for transmission over shorter lines because the shorter lines can accommodate the higher data transmission rates of OFDD and the longer lines are capable of the lower transmission rates that FDD provides.

Regarding claim 40, Cioffi in view of Bingham et al discloses the limitations of claim 39 as applied above. Further, Cioffi discloses that an extra cyclic prefix is used for OFDD transmissions over shorter lines (col. 8, lines 28-31), and frequencies above an FDD band are not used for longer lines. Cioffi discloses that the use of a cyclic prefix is used, and it is considered to be an "extra cyclic prefix" which is preferably doubled (col. 8, lines 32-34). Further, because the FDD modulation technique is used over the longer lines, it is inherent that frequencies above the FDD band would not be utilized. Because there is no other modulation technique used on the longer lines other than FDD, it is inherent that there are no other frequencies present above the FDD band on the longer lines.

Regarding claim 41, Cioffi in view of Bingham et al discloses the limitations of claim 40 as applied above. Further, Cioffi discloses the use of a cyclic prefix with OFDD which is used over shorter lines, and hence discloses that the cyclic prefix is dimensioned for a shorter line.

10. Claims 27-29, 33, 34, 43-45, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi in view of Bingham et al (5680394 - previously cited in the first office action).

Regarding claim 27, Cioffi discloses a telecommunications system comprising: a central station (fig. 6, ref. "ONU"); subscriber lines of different lengths, the subscriber

lines being grouped into longer and shorter lines, shorter lines are defined as lines having a length less than X, and longer lines are defined as lines having a length equal to or greater than X, where X is a system parameter determined for a given telecommunications system. It is inherent that the telecommunications system of Cioffi will consist of subscriber lines of different lengths. Cioffi also discloses that there are fundamental differences in applicable data rates that are dependent upon the length of the subscriber lines (col. 6, line 62 – col. 7, line 7). Further, it is inherent that among lines of differing lengths, some lines are considered "longer" and some lines are considered "shorter". An arbitrary distinction between the long lines and the short lines can be made by the selection of a distinguishing distance "X". Because Cioffi has made a distinction between longer lines and shorter lines, the selection of a distinguishing distance X is inherent to allow for a determination between the longer and shorter lines. Cioffi has made a grouping distinction between longer and shorter lines, and therefore, Cioffi has inherently defined the shorter lines to be those which are shorter than X and the longer lines to be those which are longer than X. Cioffi further discloses a plurality of data modems linked to a central station by subscriber lines of differing lengths (fig. 6; col. 7, lines 33-43), in which duplex data is transmitted between the central station and one or more modems using ADSL (col. 1, lines 31-33). Cioffi discloses that the subscriber lines are grouped into longer and shorter lines (col. 6, line 62 – col. 7, line 7). Cioffi further discloses that data is transmitted by using discrete multi-tone transmission (col. 2, lines 37-40). Discrete multi-tone transmission is known in the art as OFDD and is characterized by the use of multiple carriers for both the upstream and downstream

transmissions. FDD is known in the art as dividing the upstream and downstream transmission channels in a wired communication system using different carriers. OFDD uses multiple "tones" (col. 1, line 25) or carriers and can accommodate higher bandwidth. Hence, OFDD modulation is capable of higher transmission rates, and FDD is capable of lower transmission rates. Cioffi teaches that systems of shorter loop distances are able to handle higher transmission rates, and systems with longer loop distances are limited to lower transmission rates (col. 6, line 62 – col. 7, line 7). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize FDD for transmission over longer lines and OFDD for transmission over shorter lines because the shorter lines can accommodate the higher data transmission rates of OFDD and the longer lines are capable of the lower transmission rates that FDD provides. Cioffi discloses the use of ADSL but not explicitly the use of VDSL. However, Bingham et al teaches that VDSL is the latest generation of subscriber line intended to facilitate the highest possible transmission rates (col. 1, lines 62-67). Bingham et al further teaches that a proposed method of modulation for VDSL is OFDD using different frequency bands for the upstream and downstream communications (col. 2, lines 13-18). It is an advantage to use the fastest technique available for a subscriber service. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize VDSL in the telecommunication system of Cioffi because it will provide the fastest possible communication link.

Regarding claim 28, Cioffi in view of Bingham et al discloses the limitations of claim 27 as applied above. Further, Cioffi discloses that an extra cyclic prefix is used for OFDD transmissions over shorter lines (col. 8, lines 28-31), and frequencies above an FDD band are not used for longer lines. Cioffi discloses that the use of a cyclic prefix is used, and it is considered to be an "extra cyclic prefix" which is preferably doubled (col. 8, lines 32-34). Further, because the FDD modulation technique is used over the longer lines, it is inherent that frequencies above the FDD band would not be utilized. Because there is no other modulation technique used on the longer lines other than FDD, it is inherent that there are no other frequencies present above the FDD band on the longer lines.

Regarding claim 29, Cioffi in view of Bingham et al discloses the limitations of claim 28 as applied above. Further, Cioffi discloses the use of a cyclic prefix with OFDD which is used over shorter lines, and hence discloses that the cyclic prefix is dimensioned for a shorter line.

Regarding claim 33, Cioffi in view of Bingham et al discloses the limitations of claim 27 as applied above. Further, in the system of Cioffi in view of Bingham et al, it is inherent that different sub-carriers are used in up-stream and down-stream transmission directions. The FDD modulation technique is defined such that different frequency bands are utilized for the up-stream and down-stream transmissions.

Regarding claim 34, Cioffi in view of Bingham et al discloses the limitations of claim 27 as applied above. Further, it is obvious to apply a power boost to the FDD

band transmissions over the longer lines because the transmission has a longer distance to travel and requires more power.

Regarding claim 43, Cioffi discloses a method of transmitting duplex data between a central station and at least one of a plurality of data modems in a telecommunications system having the plurality of data modems connected to the central station by subscriber lines of differing lengths (fig. 6; abstract; col. 6, line 62 – col. 7, line 7), the method comprising grouping subscriber lines into longer and shorter lengths, the subscriber lines being grouped into longer and shorter lengths, shorter lines are defined as lines having a length less than X, and longer lines are defined as lines having a length equal to or greater than X, where X is a system parameter determined for a given telecommunications system. It is inherent that the telecommunications system of Cioffi will consist of subscriber lines of different lengths. Cioffi also discloses that there are fundamental differences in applicable data rates that are dependent upon the length of the subscriber lines (col. 6, line 62 – col. 7, line 7). Further, it is inherent that among lines of differing lengths, some lines are considered "longer" and some lines are considered "shorter". An arbitrary distinction between the long lines and the short lines can be made by the selection of a distinguishing distance "X". Because Cioffi has made a distinction between longer lines and shorter lines, the selection of a distinguishing distance X is inherent to allow for a determination between the longer and shorter lines. Cioffi has made a grouping distinction between longer and shorter lines, and therefore, Cioffi has inherently defined the shorter lines to be those which are shorter than X and the longer lines to be those which are longer than X. Cioffi further

discloses a plurality of data modems linked to a central station by subscriber lines of differing lengths (fig. 6; col. 7, lines 33-43), in which duplex data is transmitted between the central station and one or more modems using ADSL (col. 1, lines 31-33). Cioffi discloses that the subscriber lines are grouped into longer and shorter lines (col. 6, line 62 – col. 7, line 7). Cioffi further discloses that data is transmitted by using discrete multi-tone transmission (col. 2, lines 37-40). Discrete multi-tone transmission is known in the art as OFDD and is characterized by the use of multiple carriers for both the upstream and downstream transmissions. FDD is known in the art as dividing the upstream and downstream transmission channels in a wired communication system using different carriers. OFDD uses multiple "tones" (col. 1, line 25) or carriers and can accommodate higher bandwidth. Hence, OFDD modulation is capable of higher transmission rates, and FDD is capable of lower transmission rates. Cioffi teaches that systems of shorter loop distances are able to handle higher transmission rates, and systems with longer loop distances are limited to lower transmission rates (col. 6, line 62 – col. 7, line 7). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize FDD for transmission over longer lines and OFDD for transmission over shorter lines because the shorter lines can accommodate the higher data transmission rates of OFDD and the longer lines are capable of the lower transmission rates that FDD provides. Cioffi discloses the use of ADSL but not explicitly the use of VDSL. However, Bingham et al teaches that VDSL is the latest generation of subscriber line intended to facilitate the highest possible transmission rates (col. 1, lines 62-67). Bingham et al further teaches that a proposed

method of modulation for VDSL is OFDD using different frequency bands for the upstream and downstream communications (col. 2, lines 13-18). It is an advantage to use the fastest technique available for a subscriber service. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize VDSL in the telecommunication system of Cioffi because it will provide the fastest possible communication link.

Regarding claim 44, Cioffi in view of Bingham et al discloses the limitations of claim 43 as applied above. Further, Cioffi discloses that an extra cyclic prefix is used for OFDD transmissions over shorter lines (col. 8, lines 28-31), and frequencies above an FDD band are not used for longer lines. Cioffi discloses that the use of a cyclic prefix is used, and it is considered to be an "extra cyclic prefix" which is preferably doubled (col. 8, lines 32-34). Further, because the FDD modulation technique is used over the longer lines, it is inherent that frequencies above the FDD band would not be utilized. Because there is no other modulation technique used on the longer lines other than FDD, it is inherent that there are no other frequencies present above the FDD band on the longer lines.

Regarding claim 45, Cioffi in view of Bingham et al discloses the limitations of claim 44 as applied above. Further, Cioffi discloses the use of a cyclic prefix with OFDD which is used over shorter lines, and hence discloses that the cyclic prefix is dimensioned for a shorter line.

Regarding claim 49, Cioffi in view of Bingham et al discloses the limitations of claim 43 as applied above. Further, in the system of Cioffi in view of Bingham et al, it is

inherent that different sub-carriers are used in up-stream and down-stream transmission directions. The FDD modulation technique is defined such that different frequency bands are utilized for the up-stream and down-stream transmissions.

Regarding claim 50, Cioffi in view of Bingham et al discloses the limitations of claim 27 as applied above. Further, it is obvious to apply a power boost to the FDD band transmissions over the longer lines because the transmission has a longer distance to travel and requires more power.

11. Claims 31, 32, 47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi in view of Bingham et al, and in further view of Isaksson et al (2002/0126768).

Regarding claim 31, Cioffi in view of Bingham et al disclose the limitations of claim 28 as applied above. Further, Cioffi discloses the system comprising ONUs (fig. 6, "ONU") and network terminations (NTs) or pedestals (col. 7, lines 30-44) being connected to the subscriber lines (fig. 6, ref. 206). It is inherent that the ONUs and the network terminations each contain at least one transmitter to enable communication. Cioffi in view of Bingham et al do not disclose time-synchronization being performed between all transmitters in the ONUs and NTs of the system. However, Isaksson et al teaches the time-synchronization between ONUs and NTs by the calculation of timing advance (TA) in a DSL system (fig. 22; page 6, paragraph 127; page 9, paragraph 188) to maintain orthogonality between transmission carriers. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to time-synchronize the ONUs and the NTs as taught by Isaksson et al in the system of

Cioffi in view of Bingham et al because the synchronization is beneficial to maintain orthogonality between transmission carriers.

Regarding claim 32, Cioffi in view of Bingham et al disclose the limitations of claim 28 as applied above. Cioffi in view of Bingham et al do not disclose the calculation of timing advance for each subscriber line. However, Isaksson et al teaches the time-synchronization between ONUs and NTs by the calculation of timing advance (TA) in a DSL system (fig. 22; page 6, paragraph 127; page 9, paragraph 188) to maintain orthogonality between transmission carriers. Isaksson et al teaches that the timing advance is calculated to overcome the delay on the copper wire. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made calculate a timing advance for each of the subscriber lines based upon the length of each subscriber line as taught by Isaksson et al in the system of Cioffi in view of Bingham et al because the calculation of a timing advance is beneficial to maintain orthogonality between transmission carriers and it is dependent upon each of the subscriber line lengths.

Regarding claim 47, Cioffi in view of Bingham et al disclose the limitations of claim 43 as applied above. Further, Cioffi discloses the system comprising ONUs (fig. 6, "ONU") and network terminations (NTs) or pedestals (col. 7, lines 30-44) being connected to the subscriber lines (fig. 6, ref. 206). It is inherent that the ONUs and the network terminations each contain at least one transmitter to enable communication. Cioffi in view of Bingham et al do not disclose time-synchronization being performed between all transmitters in the ONUs and NTs of the system. However, Isaksson et al

teaches the time-synchronization between ONUs and NTs by the calculation of timing advance (TA) in a DSL system (fig. 22; page 6, paragraph 127; page 9, paragraph 188) to maintain orthogonality between transmission carriers. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to time-synchronize the ONUs and the NTs as taught by Isaksson et al in the system of Cioffi in view of Bingham et al because the synchronization is beneficial to maintain orthogonality between transmission carriers.

Regarding claim 48, Cioffi in view of Bingham et al disclose the limitations of claim 43 as applied above. Cioffi in view of Bingham et al do not disclose the calculation of timing advance for each subscriber line. However, Isaksson et al teaches the time-synchronization between ONUs and NTs by the calculation of timing advance (TA) in a DSL system (fig. 22; page 6, paragraph 127; page 9, paragraph 188) to maintain orthogonality between transmission carriers. Isaksson et al teaches that the timing advance is calculated to overcome the delay on the copper wire. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made calculate a timing advance for each of the subscriber lines based upon the length of each subscriber line as taught by Isaksson et al in the system of Cioffi in view of Bingham et al because the calculation of a timing advance is beneficial to maintain orthogonality between transmission carriers and it is dependent upon each of the subscriber line lengths.

12. Claims 35, 37, 38, 51, 53, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi in view of Bingham and in further view of Cioffi (5887032; hereafter "Cioffi-'032.").

Regarding claim 35, Cioffi in view of Bingham et al discloses the limitations of claim 27 as applied above. Cioffi discloses that the subscriber lines are grouped into longer and shorter lines (col. 6, line 62 – col. 7, line 7) and that longer lines are capable of higher data rates. Cioffi in view of Bingham et al do not explicitly disclose that both ADSL and VDSL are used. However, Cioffi-'032 does teach the use of both ADSL and VDSL (col. 1, lines 23-30; col. 1, line 55-col. 2, line 21). According to the teachings of Cioffi-'032, the use of VDSL requires twisted pair lines that are generally shorted in distance than those used for ADSL (col. 2, lines 13-17). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize ADSL using FDD on the longer lines and VDSL using OFDD on the shorter lines as taught by Cioffi-'032 in the system of Cioffi in view of Bingham et al because the different standards (ADSL and VDSL) depend upon the link quality and the line distance. Because it is beneficial to make the best use of the available bandwidth, it is obvious to use VDSL where applicable on shorter lines and ADSL where applicable on longer lines.

Regarding claim 37, Cioffi in view of Bingham et al and in further view of Cioffi-'032 disclose the limitations of claim 35 as applied above. Further, Cioffi-'032 discloses that the standard modulation technique for ADSL is FDD (col. 2, lines 1-3). Therefore,

the frequency band used for FDD is used for ADSL in both up-stream and down-stream transmission directions as defined by the ADSL standard using FDD.

Regarding claim 38, Cioffi in view of Bingham et al and in further view of Cioffi-'032 disclose the limitations of claim 35 as applied above. Further, it is obvious that FDD band frequencies are power boosted to the same power level as used for ADSL because the FDD is the modulation technique used for ADSL according to Cioffi-'032 (col. 2, lines 1-3).

Regarding claim 51, Cioffi in view of Bingham et al discloses the limitations of claim 43 as applied above. Cioffi discloses that the subscriber lines are grouped into longer and shorter lines (col. 6, line 62 – col. 7, line 7) and that longer lines are capable of higher data rates. Cioffi in view of Bingham et al do not explicitly disclose that both ADSL and VDSL are used. However, Cioffi-'032 does teach the use of both ADSL and VDSL (col. 1, lines 23-30; col. 1, line 55-col. 2, line 21). According to the teachings of Cioffi-'032, the use of VDSL requires twisted pair lines that are generally shorted in distance than those used for ADSL (col. 2, lines 13-17). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize ADSL using FDD on the longer lines and VDSL using OFDD on the shorter lines as taught by Cioffi-'032 in the system of Cioffi in view of Bingham et al because the different standards (ADSL and VDSL) depend upon the link quality and the line distance. Because it is beneficial to make the best use of the available bandwidth, it is obvious to use VDSL where applicable on shorter lines and ADSL where applicable on longer lines.

Regarding claim 53, Cioffi in view of Bingham et al and in further view of Cioffi-'032 disclose the limitations of claim 51 as applied above. Further, Cioffi-'032 discloses that the standard modulation technique for ADSL is FDD (col. 2, lines 1-3). Therefore, the frequency band used for FDD is used for ADSL in both up-stream and down-stream transmission directions as defined by the ADSL standard using FDD.

Regarding claim 54, Cioffi in view of Bingham et al and in further view of Cioffi-'032 disclose the limitations of claim 51 as applied above. Further, it is obvious that FDD band frequencies are power boosted to the same power level as used for ADSL because the FDD is the modulation technique used for ADSL according to Cioffi-'032 (col. 2, lines 1-3).

13. Claims 36 and 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi in view of Bingham et al, in further view of Cioffi-'032, and in further view of "Zipper – a duplex scheme proposal for VDSL based on DMT" (reference supplied by Applicant during response to first action; hereafter "Zipper")

Regarding claim 36, Cioffi in view of Bingham et al, and in further view of Cioffi-'032 disclose the limitations of claim 35 as applied above. Cioffi in view of Bingham et al, and in further view of Cioffi-'032 do not disclose that both VDSL and ADSL are used on the same subscriber line. However, Zipper teaches a method wherein ADSL and VDSL co-exist on a single subscriber line (page 4, "Coexistence with ADSL"). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize both ADSL and VDSL on the same subscriber

line because the greatest possible bandwidth could be used to enable the greatest possible data rate.

Regarding claim 52, Cioffi in view of Bingham et al, and in further view of Cioffi-'032 disclose the limitations of claim 51 as applied above. Cioffi in view of Bingham et al, and in further view of Cioffi-'032 do not disclose that both VDSL and ADSL are used on the same subscriber line. However, Zipper teaches a method wherein ADSL and VDSL co-exist on a single subscriber line (page 4, "Coexistence with ADSL"). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize both ADSL and VDSL on the same subscriber line because the greatest possible bandwidth could be used to enable the greatest possible data rate.

Allowable Subject Matter

14. Claims 30, 42, and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M Perilla
April 7, 2004

jmp

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600